Land-based Instruments for Urban Infrastructure Development: The Experience of TDR in Mumbai

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Abstract

Mumbai, one of the few largest cities in India, faces the challenges of continuing as economic powerhouse as well as maintaining the quality of life of its citizens. Civic infrastructure and its provision are important to support economic development as well as to enhance quality of life. However, with much of the land already developed in the city and with an intense competition between various land uses, the costs associated with infrastructure development (both land acquisition and construction) are large. Although the MCGM prepared a development Master plan for the period of 1981-2005 introduced the concept of land reservations for various infrastructure services, the development of infrastructure did not progress much for the paucity of funds; moreover, the conventional method of land acquisition has met severe difficulties. An alternate way is to utilise land based instruments that offer incentives for land owners and/or developers to surrender/develop land for providing urban infrastructure. Transferable Development Rights (TDR) is one such instrument that can be used to achieve urban infrastructure development while utilizing the development potential as well as value of urban land. This paper shows how the MCGM has proposed to achieve the goal of developing civic amenities in Mumbai without burdening its exchequer. It also outlines some of the issues and the reforms required in the current TDR programme to make it more effective.

Key Words: Urban/Civic Infrastructure, Land-based Instruments, Development Reservations, Public Amenities, TDR

INTRODUCTION

Cities are experiencing rapid population growth across the world and are increasingly becoming the concentrations of economic activities. Cities in the developing world, in particular, are growing at a much rapid pace as these societies are undergoing an inevitable transition from rural-based to urban-based society. Moreover, with increasing globalisation, large cities are also undergoing structural changes in their economies that are based on human population and their skill-sets. This transformation requires careful forward planning of infrastructure of cities as well as mobilising finances for its development. In essence, the

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rapid growth of cities poses large challenges of providing adequate civic infrastructure so that the growth process continues and quality of life also improves.

Master plans or development plans are traditional instruments to plan and develop cities as well as their infrastructure. It is assumed in the process that adequate resources either exist or can be mobilised by concerned urban local governments with the help of eminent domain legislation. Indian town planning system, like several other planning systems in the world, relies on the preparation of master plans or development plans over long time horizon (typically, 20-25 years) and implementing them through the mechanisms of zoning, land use specification, development control and planning for infrastructure provision. However, as the experience shows the development cycle of infrastructure tends to be very long, cumbersome and fraught with several ground level problems (Meshram 2006). The fact that plan making itself has become very long drawn process and that it is not able to take into account fully economic development parameters are discussed in another paper i.e., Nallathiga (2012).

The development of urban infrastructure as envisaged under master plan is an important component of plan implementation, which requires urban land. However, most of the urban local governments are endowed with limited amount of land and acquiring it through provisions under Land Acquisition Act 1894 for public is often difficult and cumbersome. Land acquisition is never easy to achieve on account of following reasons (Kothari 2002): (i) private land ownership tends to be highly fragmented and would require spending good amount of time on their identification, liaison and seeking cooperation (ii) private land owners generally ask for market prices for their land, which is difficult to determine, and governments take much longer time to dispose the cases of compensation payments. Moreover, exercising compulsory purchasing powers under such eminent domain legislation is fraught with court litigations, as the land prices fixed by either government or land sales transaction prices represent 'fair price of land' sought by citizens. Also, any encroachment of such acquired land can further thwart the whole acquisition process (Kothari 2002).

Large scale land acquisitions for large public projects themselves are fraught with several problems, including public opposition, and would take much longer time than thought earlier, as experienced in the case of development of Navi Mumbai Satellite Township by CIDCO (Shaw 2004). Reservation of land for infrastructure services, thereby denying any other development on it, is another mechanism of master plans to force land owner to surrender land. However, land owners are well aware of the rise of land value in future and, therefore, wait for the expiry of reservation period (which is typically about 5-10 years) to reclaim their rights to land and its development. In this context, land based instruments such as land banks and swaps, taxes/levies on land, land pooling/readjustment schemes, town planning schemes, award of development rights (transferable and purchasable) in lieu of surrender of land rights, and leasing rights of developed space, are becoming some important means of speedifying land acquisition for the development of urban infrastructure (Mohanty 2003).

Transferable Development Rights

Transferable Development Rights (TDRs) are essentially the rights to develop built space on land that can be transferred (i) horizontally from one location to another location (*ex situ*), or, (ii) vertically from surface to above or below (*in situ).* Traditionally, the extent and intensity of development of urban land is fixed by urban planning system (under development control), and it is based on the principle of development non-transferable and site-based. However, different features of urban land give rise to different land value and competitive bidding for urban land between competing users bids up its price. In this context, the realisation of development potential offered through such land value is important to distribute such value. TDR program is meant to facilitate the effective utilisation of surplus development potential and value of such location either *in situ* or *ex situ*. TDRs have, thus, become a possible alternative to land acquisition by conventional methods for public purposes.

The Urban Development Plan Formulation and Implementation (UDPFI), Government of India (GoI, 1996) defines Transferable Development Rights as,
…'Development Right to transfer the potential of a plot designed for a public purpose in a plan, expressed in terms of total permissible built space calculated on the basis of Floor Space Index (FSI) or Floor Area Ratio (FAR) allowable for that plot, for utilisation by the owner himself or by way of transfer by him to someone else from the present location to a specified area in the plan, as additional built up space over and above the permissible limit in lieu of compensation for the surrender of the concerned plot free from all encumbrances to the Planning and Development Authority' (cited in Kothari 2002).

When TDRs are allowed to be purchased/sold in an open market, then a local market for TDR develops. Local governments undertake TDR programs to use the market to implement and pay for development density and location decision (Hanly-Forde 2006). They are based on the assumption that each unit of land in a city has the potential to accommodate at least some level of development. The potential level of development of each parcel of land is determined by the property zoning, land use and development control regulations (Shah 2005). Essentially, the differential development potential of land can be utilised in a positive manner to preserve certain land uses which are required to be kept with little or no development on site; while at the same time, this unutilised development potential needs to be tapped for beneficial use in other sector – such as residential housing. TDRs essentially serve as a mechanism to achieve this objective. However, the differential development potential and value can also be utilised to develop the community/public infrastructure (including low income housing) that is essential for urban development.

The cities/counties in the United States of America (USA) have had a long experience of utilising the TDR successfully for achieving the basic objective of preserving desired land uses through transferring their development potential to alternate sites/locations, which was also meant to achieve a compact city development rather than letting the development of urban sprawl (Lane 1998). The TDR programs in the USA appeared to offer twin advantages of controlling land use and compensating land owners, but they were fraught with several challenges of administration due to the complexities that were not so apparent, which means it requires a well planned approach (see Hanly–Forde 2006 for more details with regard to the principles of the design of TDR program).

TDR is touted as essentially a market based instrument that can be used by cities across the world under which the development potential of land is recognised and transferred to achieve the development goals without burdening the finances of the city government (Keare 1996). In the recent past, several Asian cities also began to look at it as a potential instrument for achieving the twin objectives of preserving environment and ensuring economic growth. Mumbai is perhaps the first Asian city to experiment with the TDR for developing civic amenities. A summary of the experience of TDR utilisation in select counties of the US in comparison to that in India (Mumbai) is provided in *Table 1*. Given the good features and potential of this instrument (especially in its being linked to markets), several experts recommend utilising TDR as an instrument for city development, land management and infrastructure financing (e.g., Keare 1996; Sivaramakrishnan 2002; Mohanty 2003).

Table 1: Comparison Of TDR Programme In Various Urban Centres

Parameter	Montgomery County	New Jersey	Chicago	Virginia	Mumbai (India)
Objective of TDR	Preserve agriculture	Environmental protection	Preserving land marks	To replace zoning	To acquire reserved land for public amenities
Transfer limits	Within county	Across counties	Within districts	Within county	Within MCGM limits
Development Rights based on	Acreage	Suitability of land for development	Difference between allowed and consumed FSI	Acreage	Allowable built space (subject to FSI limits)
Person getting Development Right	Farmers in agricultural areas	All farmers	Landmark owner	All land owners	All land holders having land under reservation
Development Rights Bank	Yes	No	Yes	No	No
Value of right	Multiples of five acres	Varied according to type of land	Equal to area of unutilised FSI	Depends upon use	Equal to permissible built-up area or FSI

Source: Kothari (2002)

ORIGINS OF TDR IN MUMBAI & ITS FEATURES

Origins of TDR in Mumbai

The origins of TDR lie in the difficulty to acquire land for public purposes that are laid down in city development/master plans. The Municipal Corporation of Greater Mumbai (MCGM) prepared first development plan for the period of 1964-77 (which was extended till 1981), which proposed several proposals including the development of satellite city - Navi Mumbai. However, it met with difficulties in mobilising adequate fiscal resources in order to realise them (Nallathiga 2006). Based on this experience, it has prepared second development plan, in parts, starting from 1985 with the final part of it submitted in 1993. The plan was approved by the State Government initially for the period of 1991-2005, which was further extended till 2013. Among the various elements of the development plan, the reservation of land for various public amenities[2] and the provision of infrastructure facilities assume greater importance. The reservation of land for public amenities and for the development of infrastructure facilities is an important part of the development/master plan because these two matters decide the residential quality of living enjoyed by the citizens in their premises.

For realising the designated land for public amenities, land needs to be procured and developed (including laying down/develop any structures on it for this purpose). In the past, this was primarily achieved by the planning/development authorities i.e., MCGM, MHADA, MIDC, CIDCO and MMRDA, by using the provisions of either Land Acquisition Act 1894 or their own Acts (wherein also they provide for land acquisition using a different procedure/process and compensation) to acquire land compulsorily for the development of public infrastructure and to make payment of compensation according to the process and procedure set out in the respective legislations. Compulsory land acquisition appears less costly, but it has adverse legal problems making the acquisition quite longer in time and a costly affair. However, with a shift in policy from providing compensation at government rates to that at prevailing market rates, the financial burden of land acquisition on the municipal authority has increased phenomenally in urban areas.

On contrary, the budgetary provisions of the local governments e.g., MCGM are not of the order of the magnitude enough to procure land for public amenities, leaving aside their development. It is because the budgetary allocations for various developmental needs are made according to the fiscal plan estimates of provisions, which gives fewer resources for

[2] The word amenity here requires a definition. The D. C. Regulation No. 23 defines it as, "*The word 'Amenity' means Roads, Streets, Open Space, Parks, Recreation Grounds, Play Grounds, Water Supply, Electric Supply, Street Lightning, Sewerage, Drainage, Public Work and other Utilities, Services and Convenience*" (Tendulkar and Bhatt 2003).

development/master plan implementation including the provision of infrastructure amenities. Further, apart from these responsibilities, the MCGM has its own necessary/obligatory duties to be performed e.g., street cleaning, solid waste management, transportation, health and educational services and water supply and sewerage, which are of importance to it, rendering it with operational and administrative difficulty in concentrating on implementing development plan. Bulk of the budgetary funds are therefore allocated to the operation and maintenance (or, revenue expenditure) on civic infrastructure than developing amenities.

The Maharashtra Regional and Town Planning (MRTP) Act 1966 mandated the local and regional planning authorities to prepare plans for the use and development of land in cities and empowered them with imposing regulations on them for orderly city growth (both horizontal and vertical). However, the experience shows that these powers were used to curb growth and development of cities like Mumbai through the pursuit of decongestion policies and through the imposition of restrictions on the development of land, which turned out to be a bane to city development in Mumbai (Nallathiga 2005). Further, they fuelled the price rise of land and housing in Mumbai by restricting development (Nallathiga 2004). The local governments or planning agencies suffered, as they were left with few resources to implement development plan proposals on one hand and they had to pay more amount as compensation if the land reserved for such plan proposals were acquired.

Realising the above constraints and based on the experience of difficulty in acquiring land in the previous development/master plan, the Municipal Corporation of Greater Mumbai (MCGM) had introduced the concept of Transferable Development Right (TDR) by following the examples of USA. The TDR concept was introduced under the Development Control Regulations (DCR) of MCGM 1991 of Mumbai Municipal Corporation Act 1888. Under DCR 1991, the owner of a land that has been reserved for public purpose under Development Plan may surrender his land free of cost to the planning authority and in lieu obtain a Development Right Certificate (DRC) in the form of FSI, which forms the TDR. The owner may utilise, transfer or sell Development Right (DR) under DCR 1991 (Datta 2004).

Features of TDR in Mumbai

TDR has been incorporated as the principle of achieving development in the modified Development Control Regulations (DCRs) (MCGM 1991), and DRC is one such land-based instrument based on incentivising the surrender of land for public purposes and for the development of public amenities (which form urban infrastructure development here). The mechanism for the award and transfer of DRC is laid down in the DCR 1991 of MCGM Act 1888. In the DCRs of 1991, the Clause 6 of Appendix VII which relates to grant of additional TDR in lieu of constructed amenities stipulates it as under:

'When an owner or lessee or also developers construct an amenity on the surrounded plot at his cost subject to such as may be prescribed by the Commissioner or the appropriate authority as the case may be and to their satisfaction and hands over the said developed constructed amenity to the Commissioner appropriate authority free of cost, he may be granted by the Commissioner further DR in the of FSI equivalent to the area of construction/development done by him, utilisation of which will be subject to regulations contained in the said Appendix'.

The built-up area of a TDR that is granted to the owner of the plot/land surrendered in the form of a DRC is equal to the increased or decreased gross area of the surrendered plot depending upon the permissible FSI of the zone from which it is originated. The plot owner/ user of the DRC will be permitted to utilise DRCs in accordance with TDR programme subject to the conditions on the use to which they can subjected to. Table 2 shows the permissible users in receiving areas within the (origination) zone in which the reserved plot is located. This gave rise to the concept of 'origination' and 'destination' plots/land of TDR.

Table 2 Permissible use of TDR originated in receiving areas

Zone in which designated / reserved plot is located	***User to be permitted in receiving areas***
Residential	Only residential users in residential zones
Commercial (C-2)	Commercial (C-2) users if receiving plot is situated in C-2 Zone
	Commercial (C-1) users if receiving plot is situated in C-1 Zone
	Residential only in residential zones
Commercial (C 1)	Commercial (C-1) users if receiving plot is situated in C-1 Zone
	Residential only in residential zones
Industrial (I 1, I 2, I 3)	Residential only in residential zones

Source: Datta (2004)

The TDR program was initially started with the intention of acquiring land for public amenities i.e., reservations such as gardens and playgrounds, and for road construction. In addition, the award of TDR was also made applicable to plot/land owners if they construct/develop the public amenities (or, planned reservations) as per the rules under DCR. The TDR scheme was later extended to achieve other purposes of city development like slum housing, conservation of built heritage, and even for the development/provision of public amenities that were otherwise to be provided by the MCGM. Box 1 shows the types of TDRs prevalent in the case of Mumbai:

The DRs are granted and DRCs are issued only after the reserved land/plot is surrender to the MCGM or Appropriate Authority free of cost, free of encumbrances, after the owner has levelled the land to the surrouding ground level and after he/she has constructed a 1.5 m high

compound wall with a gate and to the satisfaction of the Commissioner or Authority. A DRC issued by the Commissioner states the extent of area and FSI awarded in figures and words while recording all details of land owner. Annexure 1 shows sample DRC. The DRCs awarded may be used on one or more plots of land whether vacant or already developed or by the erection of additional storeys, or in any other manner consistent with DCRs but not so as to exceed in any plot the total FSI higher than that prescribed under the regulations of DCR. Table 3 shows the category-wise allowable TDR that can be utilised in Mumbai.

Box 1 – Various Types of TDR in Mumbai

Reservation TDR

This was laid under DCR 34, under which TDR could be given to the land owner in case of surrender of land that had been reserved for non-development use. However, since much of the land under reservation is under the Urban Land Ceiling (Regulation) Act, 1976, not much of land has actually been released under it.

Road TDR

This was laid down under DCR 33 (1), which states that the TDR certificate could be issued to the owner of land in case of voluntary surrender for the purposes of road widening and laying down of new road. It comes in between the expropriation of land and buying at market price.

Heritage TDR

This was laid down under DCR 67 (Appendix VIIA) to give an incentive to the owners of heritage buildings under which the owners who preserve and maintain the heritage structures get an incentive of additional FSI (apart from that already developed) in the form of TDR.

Slum TDR

This was issued under the DCR 33(7), (10) and (11), under which the TDR can be issued to those developers who develop Slum Rehabilitation Buildings for rehabilitating the slum dwellers. The maximum FSI that can be utilised on the plot of land, however, should not exceed 2.5 as per Section 33(10), unless the plot area is more than 500 sq m and minimum ground coverage is 25% of the slum area.

Amenity TDR

A provision for this was wade in DCR sections 33(1), (10) and Section 34 under which TDR certificate is issued to a developer for undertaking the development of following public amenities viz., Municipal Transport Garage, General Hospital, Fire Station, Auditorium, Electric Crematoria, Municipal Workshop, Municipal Primary School, Municipal Retail Market, Town Duty Office, Office Building

Table 3: Area-Wise Allowable FSI for TDR Utilisation In Mumbai

Category of TDR	Area/ activity	Allowable FSI
Reservation	Island city	1.33
	Subrubs (nearer)	1.0
	Suburbs (extended)	1.0
	Eastern City (M Ward)	0.75
Amenities	Land development	1.0
	Land development and construction work	2.0
	Construction work	1.0
Road	Land development and construction work	2.0
	Construction work	1.0
Slum	Re-development	2.5
Heritage	Forgone additional FSI of the heritage site	Equivalent to the additional FSI

Source: MCGM (1991)

The TDRs have to be utilised in any destination plot to the North of originating plot; they cannot be utilised in any part of the island city of Mumbai. Also, DCRs stipulate that the FSI or receiving plot shall be allowed to be exceeded by not more than 0.4 in respect of reservations/ road widening. Further, TDRs can be utilised under following circumstances/ conditions as per the DCRs of MCGM (Datta 2004):

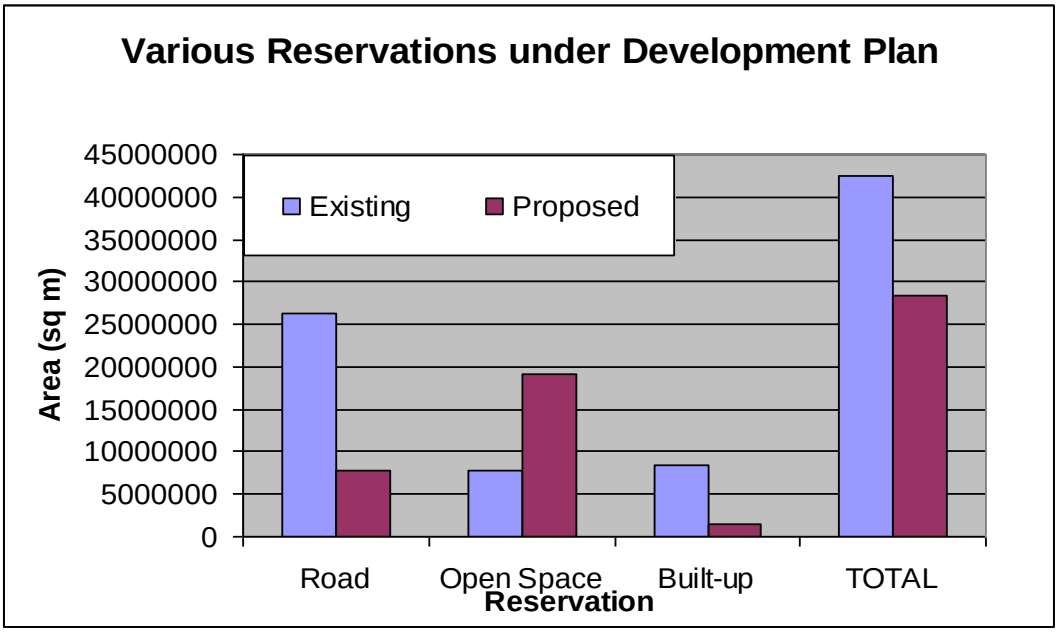
- Where permissible FSI is less than 1.0 or more than 2.0
- On plots falling within 50 m on roads on which no new shops are permitted, particularly as prescribed in Sub-regulation (2) of Regulation 52 of the 1991 DCRs
- In the Coastal Regulation Zone as defined by the Ministry of Environment and Forests
- In the No Development Zone (NDZ) and Tourism Development Zone (TDZ) and in those areas where either MMRDA or MHADA is the special planning authority
- In the island city and the following non-receiving corridors:
  (a) Western Corridor – between tracks of Western Railway and S V Road and between tracks of Western Railway and Western Express Highway
  (b) Eastern Corridor – between the tracks of Central Railway and LBS Marg.

TDR IN MUMBAI: THE NEED AND POTENTIAL

The Need for TDR

Rapidly developing cities like Mumbai require developed land for both housing as well as infrastructure development. Master/development plans are supposed to strike the balance and allocate adequate land for residential/ other developments as well as public/civic

infrastructure. Figure 1 shows the various reservations made under development plan, which were needed to be developed in the course of plan period. These reservations were initially planned for the 1991 population (9.7 million), whereas the city population went up to 11.9 million in 2001 and 12.5 million in 2011. With growing population, the mismatch between public amenities required and those provided would increase and can assume high proportion if public amenities are not provided in the plan period as laid down in the development plan.



Source: Mayfair Housing, 2005

Figure 1: Land Designated under Various Reservations within MCGM Limits

Whereas the second master plan reserved land for various public amenities, the target of bringing the land under the use of public amenities and developing them is not easy to meet. The rapidly rising population also gives rise to the threat of encroachments in the form of slums/squatter settlements. Therefore, land needs to be acquired and developed for the provision of civic/ public amenities, the costs of which need to be borne by the MCGM. The expected costs of land acquisition and civic amenity development are shown in the *Table 4.*

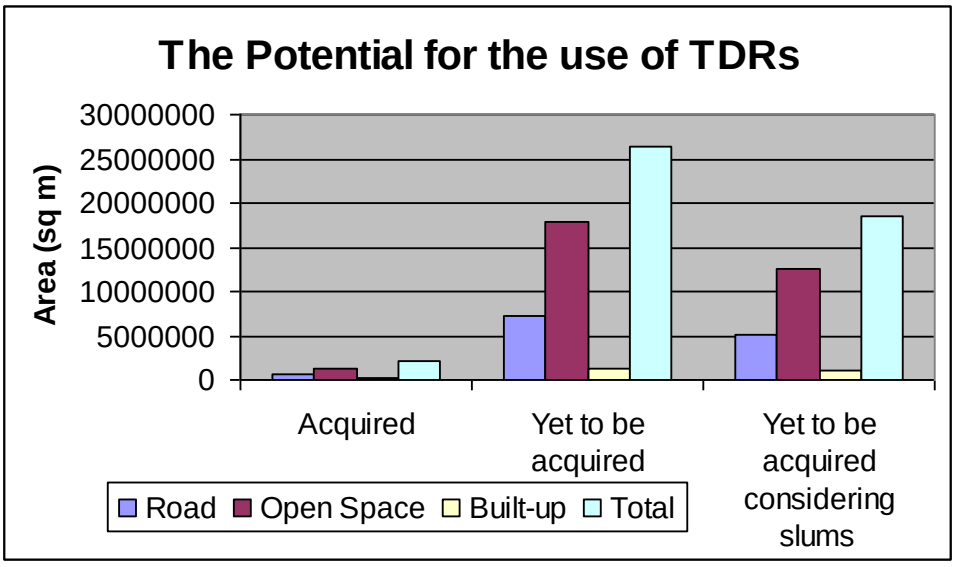
Table 4: The Costs of Land Acquisition and Development of Civic Amenities

Amenity	**Land Area (sq m)**	**Land Cost as per Ready Reckoner (RR) rates (Rs Lakhs)**	**Amenity development costs (Rs Lakhs)**	**Total Cost as per RR rates (Rs Lakhs)**
Road	5,050,269	651,868	63,128	7,14,997
Open Space	12,592,103	1,745,644	1,25,654	1,871,298
Built-up	1,423,538	175,691	3,31,537	507,228
Total	19,065,910	25,73,203	5,20,319	30,93,522

Source: Mayfair Housing, 2005

The figures indicate that the total cost of amenity development is around Rs 30, 935 crores as per Ready Reckoner rates, and they rise to Rs. 31, 821 crores after allowing for a fuel hike of Rs. 886 crores. This is exclusive of the cost of clearance of slums/squatter settlements that occupied public land (which involves procedural notices and final eviction and was estimated to be of the order of 30% of total land), which itself may cost about Rs. 5,368 crores. These numbers substantiate the actual financial costs involved in the provision of public amenities and draw the inadequacy of municipal budget, the sum total of which itself is of the order of Rs 5,000 crores in the year 2005-06. Therefore, to hasten the process of land acquisition and urban infrastructure development, alternatives to the conventional financial resources need to be found; one of them is to make use of land-based instrument of awarding development rights (or, TDRs) in lieu of the surrender of land for development envisaged in Master Plan.

The development of public amenities/infrastructure would not only require raising significant amount of financial resources but also cost other resources of the corporation i.e., deploying its staff members for this purpose and time costs of such engagement can also be substantial. By awarding TDR, urban infrastructure can be developed without deploying financial and manpower resources. The amended DCRs of 1991 came out largely for this reason. The spirit of TDR is that if the development comes without congestion and is accompanied by the release of land and better civic amenities, it needs to be allowed through awarding development rights that can be freely traded in market. Figure 2 shows the potential of TDR.



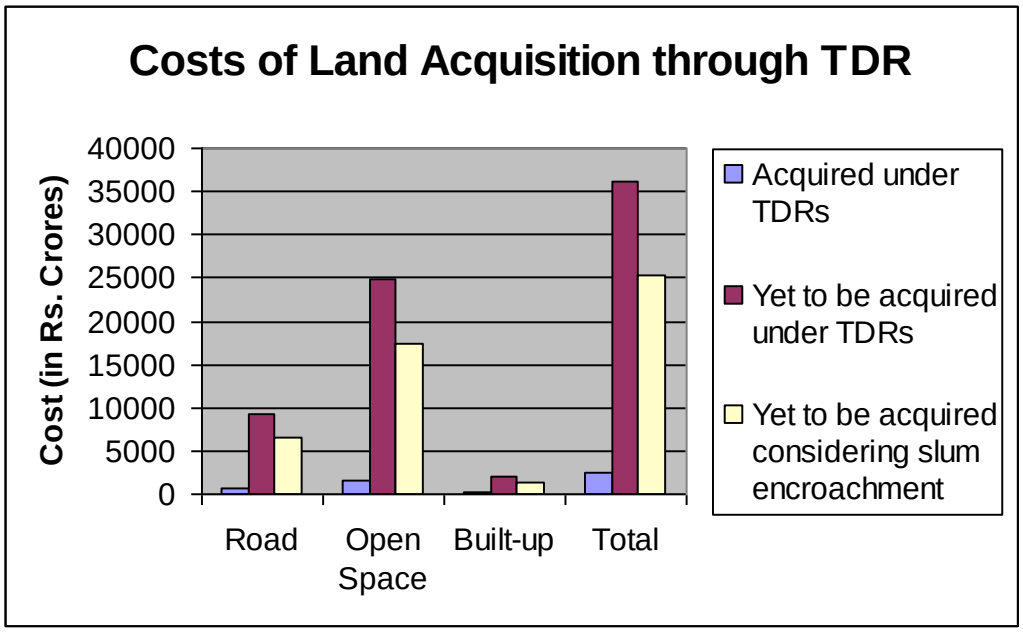
Source: Mayfair Housing, 2005

Figure 2: The Potential For The Use Of TDR In Mumbai

The Experience of TDR

After the amendment to DCRs of 1991 and the introduction of TDRs in lieu of surrender or land, there was a steady flow of TDR into the market as the market was under buoyancy and

land market prices were quite favourable to the provisions laid. About 15,64,440 sq m area was estimated to have been released into the market through TDRs, of which Road and Reservation TDR constituted 10,73,360 sq m and 4,91,080 sq m respectively (Mayfair 2005). In addition, the slum TDR to the tune of another 5,60,965 sq m got released at the same time. This itself would have resulted in monetary savings against land acquisition for the same purpose to the magnitude of about Rs 1,841 crores (as per Ready Reckoner rates) at 2004 prices. However, in spite of the amendment made to DCRs, the TDR scheme has not been adaptive to meet the intended objectives in a dynamic market condition. The utilisation of the full potential of TDRs in obtaining land acquisition as required under the development has is long way to go. This is evident from the following diagram (figure 3) which depicts the profile of land acquisition in terms of costs of the acquisition.



Source: Mayfair Housing, 2004

Figure 3 : Land Acquisition Under TDR

Moreover, the following table (Table 5) indicates the pending cases and the area that was not acquired in spite of the land handed over under TDR, which was yet to be developed.

Table 5: Land Surrendered Under TDR For Reservations

Amenity	No. of Cases	Area (In Sqm)
Open space	245	11,45,944
Buildable services	49	1,37,427
Road	326	4,98,343

Source: Mayfair Housing, 2005

The TDR has a good potential for utilisation in any land scarce city like Mumbai and among the various categories road, reservation and amenity TDRs are primarily beneficial to city development from the view point of development plan implementation. The Heritage TDR has not been much popular in Mumbai as it did not have enough compensation for existing property owners and the Slum TDR can be considered as more of a public policy decision that is fraught with political issues. Table 6 lists TDR utilisation status of the city in 2003.

Table 6: TDR Utilisation Under Various Components

TDR Component	Area surrendered in lieu of TDR (sq m)
Roads TDR	10,73,360
Reservations TDR	4,91,080
Total TDR issued	15,64,440
Slum TDR	5,60,965
Total TDR utilised	21,25,405

Source: Mayfair Housing (2004)

It is important to know how TDR has been beneficial to the city on the whole. An important benefit is that land acquisition to that extent would have taken place without incurring any costs for land acquisition as well as without foregoing the costs of development of roads and reservations. A summary of the development costs saved and land costs avoided through the utilisation of TDR in Mumbai are provided in *Table 7*. In the case of land costs avoided, two different illustrations are provided as the rates of official guide Ready Reckoner are considered to be on a higher side as compared to the prevalent market rates of land.

Table 7: Illustration Of Benefits Of TDR Utilisation As Cost Savings

Costs and benefits of TDR utilisation	Rs. Crores
Cost of development of roads handed over by TDR	60.25
Cost of development of reservations handed over by TDR	139.5
Acquisition costs saved by TDR assuming market land rate	720
Acquisition costs saved by TDR assuming ready reckoner rate	1,841

Source: Mayfair Housing (2005)

In spite of the good amount of cost savings and speedier land acquisition and/or its development, the TDR flow was largely dependent upon operation of its parent land/property market in Mumbai. In the early and mid 1990s, when land prices were very high, enthusiasm for new scheme was running high, TDR was also traded at high price and therefore the release of TDR was high. However, over time, land owners realised that the economic gain from TDR utilisation in the suburbs was lesser than the loss they incurred through the

surrender of land, and, hence, there has been a slack in the release of TDR. Moreover, the collapse of property market after mid and late 1990s had a similar pronunciation to TDR market and therefore the volume of transactions declined significantly thereafter. The volumes of TDR flow have come down and it is traded in 'thin markets'.

However, contrary to the need for the revival of TDR supply and its market, there is a widespread perception in the citizenry that the TDR scheme had been misused to greatest extent. Such voices are put forth by the activists and neighbourhood groups to the extent that they consider this scheme as more damaging to the city. The Juhu Ville Parle Development (JVPD) Scheme citizens were vociferous in complaining about how TDR has led to congestion of roads, burdened their social infrastructure and reduced light and ventilation availability, which exhibits the complexities associated with the TDR program design (Ray 2003). It is also important to understand the underlying political tones of these arguments. A proper assessment of infrastructure may be made beforehand and an upgradation needs to be made, if required. Although the impact of TDR on local infrastructure needs further study (given that the effects are not straight forward as they might appear), the above claims amount to what is known as NIMBYism.[3] On contrary, the TDR has not been utilised to the fullest of its potential. Only a fraction of the land to be acquired under development plan has been acquired and/or developed through TDR scheme, as evident from the *Table 7*.

Table 8: Utilisation And Potential For TDR Within DP Framework

TDR Category	Area already surrendered (sq m)	Area yet to be surrendered (sq m)
Road development	4,91,080	52,00,000
Reservations development and construction	7,15,222	141,00,000
Slum redevelopment	5,60,965	NA

Source: Mayfair Housing (2004)

EXPERIENCE OF TDR IN MUMBAI: ISSUES AND REFORMS

Issues of TDR

Although the TDR scheme in Mumbai has been touted as effective in achieving land acquisition without compensation issues and also served as an instrument with the potential

[3] NIMBY is an acronym for 'Not In My Back Yard' and NIMBYism is the argument against any proposal set up in one's environs which one considers damaging. It assumed a lot of debate in the Europe after the environmental debate and then also in the planning exercises. For details see Saint et al (2009)

to finance public infrastructure/ amenities development as enshrined under the city Master/development plan, the TDR scheme also raises some issues that are yet to be resolved, which are discussed in the following sub-sections.

(a) Geographical Inequities Of Development

While the TDR was primarily created as a mechanism to promote development of city infrastructure, it has actually led to inequities of development within Mumbai. The island city, which was protected from congestion that would take place due to further development, has largely been the sending area, whereas it actually had a strong well built infrastructure and, therefore, the potential for absorbing more development. Moreover, the lower market value of TDR meant a substantial discount price to those who surrender land and, therefore, little incentive left for further TDR release. The suburbs being close to island city have largely been the receiving areas, but some of the areas lack adequate infrastructure to take additional burden and efforts were not made to ensure that these receiving areas would get better infrastructure facilities beforehand. These inequities took an extreme movement with the relatively undeveloped areas on the eastern part of the city began to send TDR to the well developed areas on the western part, but technically right on the northward of the plot. To some extent, it was helpful for real estate developers to build additional luxury housing for the people in already well developed areas, but it created some furore.

(b) Inadequate Room For Utilisation

The limits imposed on the utilisation of TDR have severely restricted the potential for utilisation of TDR. Some of the locations in farther suburbs that have a low permissible development (or FSI less than 1) have had a potential to absorb more development from TDR with given infrastructure but they were barred from receiving it. Also, it has been argued by Patel and Phatak (2005) that the zones between suburban railway lines and the highways are also the areas with greater access to transport infrastructure and would not burden other infrastructure much and, therefore, could potentially receive more TDR and absorb more development. However, on contrary, these zones were barred from receiving TDR. The limits also get confirmed with the ceiling placed on the development of CRZ and NDZ areas, wherein no development is permitted even as of now. Therefore, it appears that the TDR program has not been given adequate room for the development of lands to their potential.

(c) FSI Restrictions On TDR

The MCGM has also laid down limits on FSI permitted under different types of TDR, which limits the indiscriminate use of development potential of land. Table 3 details the limitations imposed on TDR utilisation through FSI caps. These are apart from the limits imposed on the consumption of TDR. The FSI restrictions, which have already been a bane to the city and its development, have reduced the potential of TDR in many ways, particularly by giving no incentive for exchange. It has been argued by some researchers that these restrictive FSI policies have had impacts on city development, land markets and housing at large (Nallathiga

2005, Nallathiga 2004, Phatak 2003, Nallathiga 2003, and Bertaud and Brueckner 2003). However, the relaxation of FSI has been done some time ago to achieve objectives other than urban infrastructure development e.g., slum redevelopment, increasing developer's profit, raising finance for public expenditure, which led to counter results and public furore.

(d) Ineffective Market for TDR

Although the MCGM recognised that the TDR as a mechanism for financing the development plan implementation, it has neglected the aspects of developing a good market and a trade house (or, what is referred to in literature as TDR bank). The market for TDR is largely a private market that emerged from the initiative of some housing/real estate groups, and it is functioning on the private exchanges and negotiations. This resulted in not only thin volumes/exchanges but also made the whole process non-transparent. Apparently, the MCGM did not have expertise in the operation and management of TDR markets and control of transactions, but a trading house could have been established in association with the groups that have an expertise in this operation and managed together. In the US, this function is often 'outsourced' to a professional third party. The concern about the declining value of TDR and its utilisation is genuine and it is also happening due to poor information base of the TDR flow and exchanges. It is important for the MCGM to realise that the efficient secondary market for TDR will keep a check on surging land prices and provide option for providing development where there is demand and where it can be absorbed.

(e) Design Problems With TDR

There are some fundamental inadequacies in the TDR design that reduce its potential, as evident from the fact that the additional flow of TDR in the market is reducing when large amount of TDR cases are pending for development. The main impediments to the release of TDR are related to the cost of land development vis-à-vis the cost of TDR and they include:

(i) *The TDRs given against entire range of amenities has been uniform*

The TDRs for fully buildable reservation/area has been 100% of the FSI available on that land. Whereas, for Roads it has been fixed as 25% and for all other amenities it has been fixed very low at 15%. This fixation of ratios was somewhat arbitrary, and perhaps related to the land prices prevailing in the early 1990s. These fixations have not accounted for or reflective of costs of development of respective amenity.

(ii) *The varying cost of development in varying cases of amenities was not considered*

Contrary to the fixed apportionment of land area as TDR, the cost of development of respective amenities is different in case of roads, play grounds, recreation grounds, open spaces, parks, municipal schools and hospitals respectively i.e., same amount of TDR has been given to develop schools and open spaces when the development costs are disproportionately different. Some amenities like schools and hospitals involve large costs that need to be recovered through TDR significantly higher than 100%.

(iii) *The Cost of Development has not been incorporated into the allocation process*

The land owner, or a developer on his behalf, when develops a plot of land incurs costs in it. Unless they are recovered through the TDRs, there will be no incentive to do that. To the contrary, the design of TDR has not been such that it ensures the costs being considered in itself so as to encourage the land owner to develop the amenity. For example, by 2002, the costs of road development have increased by 20%, the development of open space increased by 15% and the costs of developing built-up space increased by 10%. It is unrealistic to assume that the land will be released and amenity will be developed even when the TDR that will be awarded against it is inadequate. Evidently, there is no incentive for doing that.

Reforming TDR System

As mentioned earlier, while determining the amount of TDRs given, the municipal corporation has adopted a method of allocation in which a fixed proportion of TDR will be awarded against the surrender of land and development for each kind of amenity respectively. These proportions have been arbitrary and rather insensitive to the costs of land or its development. They served useful purpose in the early 1990s when the prices of land were very high and real estate markets were in the boom stage. After the slump in the real estate market in late 1990s, the price of land has undergone a drastic change. In the suburbs, where most of the TDR is utilised, it reduced to almost one-fifth to one-sixth of land price prevailing then. However, the cost of construction has steadily increased with the rise in material and man power costs. Hence, the TDR acquired against the development of amenities is barely enough to meet with the costs incurred, primarily because of a very low proportion of TDR given right now. Table 9 reveals the current costs (as in 2005) of amenity development vis-à-vis TDR price.

Table 9: Amenity Development Costs And TDR Prices

Amenity	Current Construction Cost (per sq ft)	Current Price of TDR in East/West suburbs (per sq ft)	Construction cost (after adding 10% increase)/ TDR price
Cemetery/Play Ground	44.23	450	14%
School/Hospital	1217	450	297%
Garden/Recreation Ground/Park	189.42	450	45%
Road	200.58	450	48%

Source: Mayfair Housing, 2005

The following reforms are needed for much effective role of the TDR in urban/civic infrastructure development in Mumbai:

a) *Rationalise The TDR Fixation*

The current policy of fixing TDRs is purely based on the proportion laid in the DCRs framed in 1991. Incidentally, these provisions did not account for any of the costs borne by the land owner or developer in the development of amenity. The TDRs need to be rationalised to include the various costs incurred by the private party and the TDR should fetch him an equivalent amount in return. The rationalisation needs to include both direct and indirect capital costs i.e., construction costs and supervision charges, interest costs of working capital and minimum return (or, profit) required to undertake the work.

b) TDRs To Reflect The Market Prices And Construction Costs

A major revision of current TDR fixations needs to be done to reflect upon actual market prices. This can make use of prevailing market prices of TDRs and/or real estate land values and also the costs incurred in development. The cost rationalisation discussed above needs to be made as a principle for awarding DR against the prevailing land/TDR price. DCRs may be amended to incorporate this incentivization to allow major development of the amenities.

c) Speedify The Land Development Through TDRs

The release of land and its development for provision of amenities needs to be hastened through TDRs at this moment. Most of the land which lies undeveloped is prone to illegal encroachments and the legal persuasion of the matter makes it much more difficult and costly. This, however, can be easily avoided by simplifying the application process and actively encouraging the private parties to develop such amenities.

d) Streamline The Process Of TDR Awarding

Currently, the procedure to be followed for the acquisition of DR certificate against development of amenity is long. Because of this, the capital/investment becomes locked and not available to the land owners and developers. Besides, there is a lot of uncertainty about the application. The TDR certificate awarding process should be hastened and the period needs to be brought down to about 12-24 months from the date of application. The documentary, cost and field verification processes need to be streamlined such that the above objective of reducing processing time is achieved.

CONCLUSIONS

With rising urban population and the rapid rise of land prices, cities increasingly find it difficult to provide requisite infrastructure services with limited fiscal capacity. Conventional methods of land acquisition and infrastructure development are increasingly becoming ineffective. In this context, land-based instruments, such as TDR, offer the potential of acquiring land and developing infrastructure in cities by using land as a resource. This paper first discussed the design features of TDR and later has shown the potential of TDR as an

instrument that avoided land acquisition while also financing urban infrastructure development in Mumbai. Some of the shortcomings from the experience of TDR in Mumbai are also noted and the reforms for further improvement are highlighted in this paper.

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Annexure 1

Sample format of Development Right Certificate

Municipal Corporation of Greater Mumbai

Development Right Certificate

I,....., Municipal Commissioner for Greater Mumbai certify that the person(s) within named in this certificate is/are the registered holder(s) of the Development Right Certificate issued subject to the provisions of the regulation No.33(10) & 34 read with Appendix VII (B) of the Development Control Regulations for Greater Mumbai, 1991 as amended upto date.

1. (a) Location & details of the land on which S.R.P. .....
   (Slum Rehabilitation Project) is sanctioned.
   (b) Area of the land on which S.R.P. is sanctioned. . .....
   (c) Zone of the land in 1(a) above .....
   (d) Number & date of approval of S.R.P. sanctioned .....
   by S.R.A. (Slum Redevelopment Authority)

2. (a) B.U.A. sanctioned in the form of T.D.R. in the S.R.P. .....
   (b) Number & date of the order issued by C.E.O., S.R.A. for 2(a) above.

3. (a) Built up area of the developed reservation handed over to M.C.G.M.
   (b) Possession Receipt No. & date .....
   (c) Reservation of built up amenity .....

4. The area where D.R.C. can be utilised .....

Building File No. ..... Certificate No. .....

Names of DRC holders: .....

FSI Credit of Built-up Area in Sq. M. .....

Signature of
Chief Engineer,
Development Plan

Signature of
Municipal Commissioner
for Greater Mumbai

The Development Right Certificate also contains the details of utilisation of DRC and transfers: Sl. No., Date, Details of property where DRC is proposed to be used i.e., receiving plot, Name and Address of utiliser, Building File No., Area proposed to be used in sq. metres, Reduced Area of DRC in words and figures, Sanction No. and Date, Signature of Chief Engineer, Development Plan and Signature of Municipal Commissioner.